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a succession of forest forms, the birch and pine entering soon as pioneers; there followed then in turn the oak, the spruce, and finally the beech. The second part opens with a treatment of Carpathian genera which show slight variation, or which on the other hand are strikingly variable; this study results in interesting deductions of evolutionary importance. There follow a consideration of phenological phenomena, an account of the cultivated plants of the Carpathians, and a phytogeographical description of the thallophytes and bryophytes, which too often are ignored in such treatises. The treatment of the thallophytes is brief, owing to inadequate knowledge of their distribution, but the account of the bryophytes is more satisfactory. The western Carpathians are richer in bryophytes than the eastern Carpathians, owing to the greater rainfall and humidity. The third and final part treats in detail the particular features of the different districts of the Carpathians.—HENRY C. COWLES.

Plant anatomy

A second edition of STEVENS' *Plant anatomy*⁵ has appeared three years after the first edition, which was reviewed in this journal.⁶ That review stated fully the purpose and method of the book, so that only the notable new matter in the second edition needs notice here. It consists of a chapter of 38 pages on reproduction, and has been made imperative by the recent rapid development of plant-breeding as a science, involving as it does the fundamental principles of heredity. Professor STEVENS outlines first the mechanism of sporogenesis and of fertilization as now understood, and then presents in a clear and practical way the conclusions that have been reached by the application of MENDEL'S law. As said in the previous review, Professor STEVENS is an excellent teacher, and therefore, by text and apt illustrations, he has made an obscure region as luminous as it can be made for an elementary student.

As an elementary text on physiological anatomy, in which tissues and their functions are interwoven in their presentation, this volume is unique. It is not the new vascular anatomy, with its phylogenetic motive; or the old anatomy, with its deadness of detail; but the old "skeleton" animated by physiology and ecology rather than by evolution.—J. M. C.

MINOR NOTICES

Das Pflanzenreich.—Part 41⁷ consists of a monograph of the Garryaceae, Nyssaceae, Alangiaceae, and Cornaceae by Dr. WALTER WANGERIN. In

⁵ STEVENS, WILLIAM CHASE, *Plant anatomy*, from the standpoint of the development and functions of the tissues, and handbook of micro-technic. Second edition. pp. xv+379. *figs.* 152. Philadelphia: P. Blakiston's Son & Co. 1910. \$2.

⁶ BOT. GAZETTE 46:306. 1908.

⁷ ENGLER, A., *Das Pflanzenreich*. Heft 41 (IV. 56^a; 220^a, ^b; 229). Garryaceae, Nyssaceae, Alangiaceae, Cornaceae, von WALTER WANGERIN. pp. 17, 19, 24, 110. *figs.* 5 (26), 6 (47), 4 (38), 24 (193). Heft 42 (IV. 147). Euphorbiaceae-Jatropheae, von F. PAX. pp. 148. *figs.* 45 (155). Leipzig: Wilhelm Engelmann. 1910. *M* 9.20; *M* 7.40.

these four families the author recognizes 15 genera and about 140 species. New species are published in *Garrya* and in *Alangium*; and several recently described species of *Cornus* have been incorporated and redescribed. The work is comprehensive, conservative in generic and specific limitations, copiously illustrated, and provided with excellent keys; it should serve as a valuable and authentic guide in the taxonomic study of plants belonging to these natural groups.

Part 42 embraces an exhaustive taxonomic treatment of the Euphorbiaceae-Jatrophaeae by Professor F. PAX. The tribe comprises 12 genera, and to these are referred 196 species, of which 43, or approximately one-fourth, are new to science. One new genus is included, namely *Neojatropha* of eastern tropical Africa, where it is at present represented by two known species. A second new genus (*Ritchieophyton*) is suggested and included in the key to the genera of the tribe, but publication of it is withheld for a subsequent fascicle dealing with this family. The group is treated in a masterly way, and numerous carefully executed original illustrations amplify the lucid text. Of considerable interest is the brief section dealing with geographical distribution. Seven of the twelve genera are exclusively American, while five (including *Ritchieophyton*) are paleotropic; and *Jatropha*, the largest of all the genera, extends throughout the equatorial belt. The two great centers of distribution of these plants in America are (1) in the region from Central America southward to Brazil and Paraguay, and (2) independently, in the West Indies.—J. M. GREENMAN.

A new flora of Congo.⁸—The present volume records all flowering plants of the Congo known up to the end of 1908, and includes a limited bibliography, citation of exsiccatae, and the vernacular names in many instances. The flora embraces a total of 3546 recognized species, of which 2826 belong to the dicotyledons, 717 to the monocotyledons, and 3 to the gymnosperms. The last group is represented by *Gnetum africanum* and two species of *Encephalartos*. The main elements of the flora, as represented by leading families, are as follows: Leguminosae (415 species), Rubiaceae (299), Orchidaceae (152), Compositae (148), Euphorbiaceae (144), Cyperaceae (139), and Gramineae (132). A very interesting tabulation is given showing the growth of our knowledge of the flora from 1896 to 1908. The work is well indexed, but is entirely without keys to genera or species. Brief keys leading to the species, particularly in the case of the larger genera, would have added considerably to the usefulness of the book.—J. M. GREENMAN.

Paleobotanical literature.—JONGMANS⁹ has begun the publication of a very useful and a most laborious series, presenting a complete and well-organized

⁸ DURAND, THÉOPH. ET HÉL., Sylloge Florae Congolanae. Bull. Jard. Bot. Brux. 2:1-716. Bruxelles: Maison d'édition A. Castaigne. Albert de Boeck, Successeur. 1910.

⁹ JONGMANS, W. J., Die palaeobotanische Literatur. Vol. I. pp. iv+217. Jena: Gustav Fischer. 1910. M 7.